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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/937,122	09/20/2001	Eit Drent	TS0801 US	6137

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Shell Oil Company
PO Box 2463
Houston, TX 77252-2463

EXAMINER

REYES, HECTOR M

ART UNIT	PAPER NUMBER
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1625

DATE MAILED: 07/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/937,122

Applicant(s)

DRENT ET AL.

Examiner

Hector M Reyes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 to 13 is/are pending in the application.
- 4a) Of the above claim(s) 11 to 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 to 10 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Paper Entry

Examiner acknowledges Applicant's Response to Election Requirement, filed on June 6, 2003 as paper no. 5.

Election

Applicant's election without traverse of Group I, embracing claims 1 to 10 is hereby acknowledged.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1 to 10 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for:

- The carbonylation process of 1,3-butadiene using methanol and a catalyst prepared from Palladium acetate as a palladium source and the specific ligands outlined in the examples provided in pages 14 through 19 of the specifications and using the four anions sources

Does not reasonably provide enablement for:

- The carbonylation of any other conjugated diene using any other alcohol or hydroxyl-containing compound or using any other palladium cation source or any other ligands or other anion source.

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The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to prepare the invention commensurate in scope with these claims. See MPEP 2164.01

Some of the factors considered in the present rejection are:

The Nature of the Invention

The broader interpretation of the claimed invention is described as *a carbonylation process of any possible conjugated system comprising:*

- ***Any hydroxyl containing compound***
- ***A general described catalyst as having:***
 1. ***Any possible source of Palladium source***
 2. ***Any possible phosphorus ligand having the wide limitations presented in the claims***
 3. ***Any possible source of anions.***

Clearly, the claimed invention is extensively broad.

The State of the Prior Art

The carbonylation of 1,3-butadiene is already known process using specific catalyst, see for Example US patent 5495041. Nonetheless, prior art of a similar process is not considered obvious if a different and distinct catalyst is used in the process due to the unpredictable behavior of catalysts. See **Ex parte Sixto, 9 USPQ2d 2081 (1988)**.

The level of Predictability in the Art

Catalysts are held to be unpredictable aspect in the chemical arts and therefore similar catalysts are expected to behave differently.

The existence of working examples

The prior art, as well as the instant specification provides very limited examples in the carbonylation of 1,3-butadiene. Changes in examples produce different results.

Experimentation required to make the invention

The general method being described in the claims represent a research area wherein reaction conditions and specific catalyst are need to be determined and synthetic approaches would be require to be tested base on the nature of each specific reactant subjected to the specific reaction process. Because of the dramatic broader nature of the subject matter out of the range of the specific examples provided, ***a patent granting the said general process would obscure a research area without any benefit to the public.***

Undue experimentation would indeed be required in order to:

- Prepared the catalysts that although embrace by the claims are not included in the examples of the specification
- Carry out the carbonylation process of 1,3-butadiene and other conjugated systems under the wide variety of reactions conditions and catalysts as described in the claims. See **In re Wands**, 8 USPQ 2d 1400 and **In re Wright** 27 USPQ 2d 1510.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 1 through 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1:

- The phrase “conjugated diene” is indefinite because it is not clear which conjugated diene would satisfy the limitation of the claim. Can any conjugated diene be use in the claimed process? Can the said conjugated diene contain substituents?
- The phrase “hydroxyl group-containing compound” is indefinite because it is not clear what is structure of the required compound. Is the said compound a carboxylic acid? Or and alcohol? And among all possible alternatives, which ones can or cannot satisfy the limitation of the claimed method?

In claims 1, 4, 5, 6, 7 and 8

- The description of the required catalyst is vague and indefinite because the required catalyst is not clearly defined. The following terms used in the said general description lack clarity and definition:
 1. a source of Palladium anions
 2. ..a phosphorus containing ligand
 3. a source of anions
 4. a substituted or unsubstituted cyclic groups
 5. bivalent organic bridging group

6. substituted or unsubstituted [3,3,1] or [4,2,1] 9-phosphabicyclononyl group
 7. phosphabicyclononyl rings ..substituted with one or more alkyl groups having from 1 to 4 carbon atoms...
 8. protonic acid with a pKa value >1 ...or a salt...
- A clear definition of the catalyst is required. Applicant is advised that catalytic processes are held in the art as unique processes because of the unpredictable behavior of catalyst. Therefore, similar catalysts are not expected to behave similarly even when all other parameters of a given process are maintained controlled or vice versa. See, for instance, **Ex parte Sizto**, USPDQ2d 2081 (1988).

In claim 9

- The phrase *methyl pentenoate and/or dimethyl adipate* represents a simultaneous use of inclusive and exclusive language, which is confusing and indefinite. What is obtained, a product or a mixture of both products?

Claim 10 is indefinite because:

- The claimed process to prepare caprolactam, although it is claimed is not described. What are the active steps in the said method? And
- The phrase "a compound, as prepared according to claim 1" increase the lack of definition of the said claim because the required compound is not identify and
- It is not clear what other conditions are required in order to convert the said unknown compound into Caprolactam.

CONCLUSION

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

The Following documents disclose or are related to carbonylation processes of conjugated systems using Palladium compounds as catalysts:

Jenck et al, US patent 4433164

Drent et al, US patent 4861912

Drent US patent 5028734

Sielcken et al, US patent 5495041

Tsai et al, US patent 6010975

Asgterberg et al, US patent 5672732

Denis Us patent 5087735

Sielcken et al US patent 6232262.

Any inquiry concerning this communication should be directed to Hector M. Reyes whose telephone number is (703) 605-1153. The examiner can normally be reached on Monday to Friday from 8 am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner 's supervisor, Allan Rotman, which telephone number, is (703) 308-4698. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-4556 or for regular communication and (703) 308-4242 for After Final communications.

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Any inquiry of a general nature or relating to the status of the application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1235.

Héctor M. Reyes PhD, JD

July 16, 2003

A handwritten signature in cursive script that reads "Alan L. Rotman".

ALAN L. ROTMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600